



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/562,798

12/29/2005

Toru Maeda

070456-0098

8704

20277 7590 06/27/2011  
MCDERMOTT WILL & EMERY LLP  
600 13TH STREET, N.W.  
WASHINGTON, DC 20005-3096

EXAMINER

HARRIS, GARY D

ART UNIT

PAPER NUMBER

1727

NOTIFICATION DATE

DELIVERY MODE

06/27/2011

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mweipdocket@mwe.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/562,798	<b>Applicant(s)</b> MAEDA ET AL.	
	<b>Examiner</b> GARY HARRIS	<b>Art Unit</b> 1727	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 05 April 2011.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,3-9 and 11-16 is/are pending in the application.
- 4a) Of the above claim(s) 8 and 16 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-7, 9 & 11-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>04/18/2011</u> .  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

The following action is in response to remarks filed on 04/05/2011.

### ***Information Disclosure Statement***

The information disclosure statement submitted on 04/18/2011 has been placed in the application file and the information referred to therein has been considered as to the merits.

### ***Claim Rejections - 35 USC § 102 / 35 USC § 103***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 1, 4, 6, 9, 12 & 14 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Inoue et al. JP 05-140620.**

As to Claim 1, Inoue discloses a soft magnetic material (iron, goethite, see abstract) with a plurality of composite magnetic particles [0003]. Each of the plurality of composite magnetic particles has a metal magnetic particle including iron (main ingredient, [0004]). A lower film surrounding a surface of said metal magnetic particle and being formed of an oxide of a nonferrous metal satisfying a composition range (oxyiron hydroxide, [0012]) where oxygen is less than oxygen of a stoichiometry composition of a compound constituted of an element and oxygen that constitute the lower film [abstract, 0004-0005]. An insulating upper film surrounding a surface of said lower film and including oxygen (stabilizing treatment, [0013]). The nonferrous metal includes at least one amorphous metal (metal salt or hydroxide, [0007]) selected from the group consisting of aluminum, chromium, and silicon (oxyhydroxide for Si, [0012]). The compound provides a magnetic metal powder which provides improved oxidation stabilization [0013].

The absolute value of heat generated when a primary compound is produced ( $\text{Fe}_2\text{O}_3$ ) by a reaction between oxygen and said one of aluminum, chromium and silicon is greater than an absolute value of heat generated when a primary compound is produced by a reaction between iron and oxygen. As disclosed by applicant, the heat

Art Unit: 1727

generated is based on material. Since the materials ( $\text{Fe}_2\text{O}_3/\text{SiO}_2$ ) and the silica dioxide coating are used to encapsulate the magnetic particle the structure would inherently have equivalent absolute values of heats of formation. See MPEP 2112.

Alternatively, it would have been obvious to require an absolute value of heat generated when a primary compound is produced ( $\text{Fe}_2\text{O}_3$ ) by a reaction between oxygen and said one of aluminum, chromium and silicon is greater than an absolute value of heat generated when a primary compound is produced by a reaction between iron and oxygen to provide improved oxidation stabilization.

As to Claim 4, Inoue discloses the soft magnetic material upper film includes at least one selected from the group consisting of a silicon compound or an aluminum compound [0015].

As to Claim 6, Inoue is silent to the dust core fabricated using the material in claim one. However, the material would inherently function as a dust core in an equivalent manner as the material claimed. Further, the limitation(s) "a dust core fabricated", the Examiner notes that limitation is a preamble limitation which does not set forth any structure, but merely state(s) the purpose or intended use of the invention. As stated in the MPEP, "if the body of a claim fully and intrinsically sets forth all of the limitations of the claimed invention, and the preamble merely states, for example, the purpose or intended use of the invention, rather than any distinct definition of any of the

Art Unit: 1727

claimed invention's limitations, *then the preamble is not considered a limitation and is of no significance to claim construction.* (See MPEP 2111.02). In the instant case, a dust core would be an intended use preamble limitation.

As to Claim 9, Inoue discloses a soft magnetic material (iron, goethite, see abstract) with a plurality of composite magnetic particles [0003]. Each of the plurality of composite magnetic particles has a metal magnetic particle including iron (main ingredient, [0004]). A lower film surrounding a surface of said metal magnetic particle and being formed of an oxide of a nonferrous metal satisfying a composition range (oxyiron hydroxide, [0012]) where oxygen is less than oxygen of a stoichiometry composition of a compound constituted of an element and oxygen that constitute the lower film [abstract, 0004-0005]. An insulating upper film surrounding a surface of said lower film and including oxygen (stabilizing treatment, [0013]). The nonferrous metal includes at least one amorphous metal (metal salt or hydroxide, [0007]) selected from the group consisting of aluminum, chromium, and silicon (oxyhydroxide for Si, [0012]). The compound provides a magnetic metal powder which provides improved oxidation stabilization [0013].

Regarding the diffusion coefficient with respect to the oxygen included in the upper film that is smaller than such diffusion coefficient of iron, as disclosed by applicant, the diffusion coefficient is based on material. Since the materials

Art Unit: 1727

(Fe<sub>2</sub>O<sub>3</sub>/SiO<sub>2</sub>) and the silica dioxide coating are used to encapsulate the magnetic particle the structure would inherently have equivalent diffusion coefficient. See MPEP 2112.

Alternatively, it would have been obvious to require the oxygen included in the upper film to be smaller than the diffusion coefficient of iron in order to provide improved oxidation stabilization.

As to Claim 12, Inoue discloses the soft magnetic material upper film includes at least one selected from the group consisting of a silicon compound or an aluminum compound [0015].

As to Claim 14, Inoue is silent to the dust core fabricated using the material in claim one. However, the material would inherently function as a dust core in an equivalent manner as the material claimed. Further, the limitation(s) "a dust core fabricated", the Examiner notes that limitation is a preamble limitation which does not set forth any structure, but merely state(s) the purpose or intended use of the invention. As stated in the MPEP, "if the body of a claim fully and intrinsically sets forth all of the limitations of the claimed invention, and the preamble merely states, for example, the purpose or intended use of the invention, rather than any distinct definition of any of the claimed invention's limitations, *then the preamble is not considered a limitation and is of no significance to claim construction.* (See MPEP 2111.02). In the instant case, a dust core would be an intended use preamble limitation.

**Claim 3, 5, 11 & 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue JP 05-140620 and further in view of Watson et al. ("Synthesis of a novel magnetic photocatalyst by direct deposition of nanosized TiO<sub>2</sub> crystals onto a magnetic core", Journal of Photochemistry and Photobiology A: Chemistry, Vol. 148, 303-313, 2005.5.31).**

As to Claim 3, 5, 11 & 13, Inoue discloses a soft magnetic material having a lower and upper film.

Inoue is silent to the lower film thickness of not less than 50 nm and not more than 1 microns and an upper film not less than 10 nm and not more than 1

However, Watson discloses a soft magnetic material (iron oxide core using sol-gel process similar to applicants) (Page 304, (Col. 1, Paragraph 3) with a plurality of composite magnetic particles (Page 310, column 2 coated particles). Each composite magnetic particle has a metal magnetic particle of iron (Fe<sub>3</sub>O<sub>4</sub> as the seed particle) (Page 310, column 1). On the iron, a lower film surrounding a surface of said metal magnetic particle is formed of an oxide of a nonferrous metal (Page 310, Col. 2, the lower film is (SiO<sub>2</sub>). Watson discloses the soft magnetic material has a controllable outer layer thickness with the ultimate aim to tailor desired characteristics such as tailor the photocatalytic performance (Page 308) into the final coated particle and uniformity of coating (Page 303, Col. 2).



It would have been obvious to one skilled in the art to change the thickness of the upper and lower film in order to tailor the photocatalytic performance (Page 308) into the final product (Page 303, Column 2).

One would have been motivated to adjust the thickness of the upper and lower film in order to allow for uniformity of the coated particles. One of ordinary skill would have adjusted the thickness based on magnetic interaction between the particles as the thickness of the coatings increase, the magnetic interaction will decrease between the particles.

**Claims 7, 14 & 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue JP 05-140620 and further in view of Ueta et al. 2004/0126609.**

As to Claim 7, 14 & 15, Inoue is silent with regard to a dust core having an organic matter disposed between said plurality of composite magnetic particles to join said plurality of composite magnetic particles together and including at least one selected from the group consisting of a polyethylene resin, a silicone resin, a polyamide resin, a polyimide resin, a polyamide imide resin, an epoxy resin, a phenolic resin, an acrylic resin and a polytetrafluoroethylene.

Ueta et al. 2004/0126609 discloses a metal powder for powder for providing magnetic cores (similar to applicant see abstract) using polymeric resistant films and organic substances such as epoxy resin, phenolic resin, silicone resin, amide resin, (Paragraph 108) and discloses the use of polyamide (see table 1) (Paragraph 134-135).

Art Unit: 1727

Ueta '609 teaches molding the particles together (Paragraph 0119 & 0120) and are used in various applications because of there compressibility of the coated powder onto the magnetic core (Paragraph 0111). Since a dust core is made by mixing powdered magnetic material with an insulative binder the magnetic core is a dust core.

It would have been obvious to one skilled in the art to use a dust core (magnetic core), having an organic matter disposed between said pluralities of composite magnetic particles of Inoue in order to provide a method of molding the particles together as taught in Ueta. One would have been motivated to add the Ueta polymeric and silicone materials in Inoue in order to provide compressibility and allow molding of the magnetic material. One of ordinary skill would have recognized that a magnetic powder with a polymer or silicone would produce a moldable material and be molded into a dust core.

### ***Response to Arguments***

Applicant's arguments with respect to claims 1, 3-7 & 9-15 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

Applicant's submission of an information disclosure statement under 37 CFR 1.97(c) with the fee set forth in 37 CFR 1.17(p) on 04/18/2011 prompted the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS**

**MADE FINAL.** See MPEP § 609.04(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GARY HARRIS whose telephone number is (571)272-6508. The examiner can normally be reached on 8AM - 5PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Ruthkosky can be reached on 571-272-1291. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>.

Art Unit: 1727

Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/G. H./Gary Harris  
Examiner, Art Unit 1727

/Mark Ruthkosky/  
Supervisory Patent Examiner, Art Unit 1785